WHAT IS CLAIMED IS:

1. A method of improving the cache behavior of accessing a multidimensional index structure resident in main memory for facilitating reference to data objects stored in a database, where the index structure consists of internal nodes having pointers to child nodes and leaf nodes having to database objects, the method comprising the steps of:

associating with each node a minimum bounding rectangle ("MBR"), wherein each MBR is the minimal hyper-rectangle enclosing the corresponding data object in the case of a leaf node and all the hyper-rectangles in the child node in the case of an internal node;

representing each of one or more said MBRs by a relative representation of an MBR ("RMBR") that is the coordinates of the MBR represented relative to the coordinates of a reference MBR; and

compressing each RMBRs into a quantized, RMBR ("QRMBR") by quantizing each RMBR to finite precision by cutting off trailing insignificant bits after quantization.

2. The method of claim 1, wherein said multi-dimensional index structure is an R-tree.

3. The method of claim 1, wherein said multi-dimensional index structure is an R*-tree.

4. The method of claim 1, wherein said multi-dimensional index structure is an R+-tree.

5. The method of claim 1, wherein said multi-dimensional index structure is a Hilbert R-tree.

6. The method of claim 1, wherein each internal node has a plurality of entries where the first entry has a QRMBR and a pointer while the rest of the entries have only QRMBRs.

7. The method of claim 1, wherein each node stores a reference MBR.

8. The method of claim 1, wherein the reference MBR of a node is obtained from the corresponding QRMBR stored in the node's parent node.

9. The method of claim 1, wherein the internal nodes store QRMBRs while the leaf nodes store MBRs.

10. The method of claim 1, wherein said database resides in main memory.

11. The method of claim 1, wherein said database resides in disk.

12. A method of improving the cache behavior of accessing a multidimensional index structure resident in main memory for facilitating reference to data objects

stored in a database, where the index structure consists of internal nodes having pointers to child nodes and leaf nodes having to database objects, the method comprising the steps of:

associating with each node a minimum bounding shape, a mult-dimensional shape enclosing the corresponding data object in the case of a leaf node and all the minimum bounding shapes in the child node in the case of an internal node;

representing each of one or more said minimum bounding shape by a relative representation that is the coordinates of the minimum bounding shape represented relative to the coordinates of a reference minimum bounding shape; and

compressing each relative representation into a quantized representation by quantizing each relative representation to finite precision by cutting off trailing insignificant bits after quantization.

13. The method of claim 12, wherein each internal node has a plurality of entries where the first entry has a quantized representation and a pointer while the rest of the entries have only quantized representations.

14. The method of claim 12, wherein the reference minimum bounding shape of a node is obtained from the corresponding quantized represenation stored in the node's parent node.

15. The method of claim 12, wherein said database resides in main memory.

16. The method of claim 12, wherein said database resides in disk.

17. A multidimensional index structure for facilitating referencing data objects stored in a database, comprising:

a plurality of nodes for forming a tree comprising internal nodes having pointers to child nodes, and leaf nodes having pointers to data objects;

minimum bounding rectangles ("MBRs"), wherein each MBR is the minimal hyper-rectangle enclosing the corresponding data object in the case of a leaf node and all the hyper-rectangles in the child node in the case of an internal node; and

a quantized, reference MBR ("QRMBR") relative to which a relative representation of an MBR is calculated with respect to a reference MBR and quantized to finite precision.

18. The index structure of claim 17, wherein said tree is an R-tree.

19. The index structure of claim 17, wherein said tree is an R*-tree.

20. The index structure of claim 17, wherein said tree is an R+-tree.

21. The index structure of claim 17, wherein said tree is a Hilbert R-tree.

22. The index structure of claim 17, wherein each internal node has a plurality

of entries where the first entry has a QRMBR and a pointer while the rest of the entries have only QRMBRs.

23. The index structure of claim 17, wherein each node stores a reference MBR.

24. The index structure of claim 17, wherein said reference MBR of a node is obtained from the reference MBR in the node's parent node.

25. The index structure of claim 17, wherein said reference MBR is stored only in the root node.

26. The index structure of claim 17, wherein the internal nodes store QRMBRs while the leaf nodes store MBRs.

27. The index structure of claim 17, wherein said database resides in main memory.

28. The index structure of claim of claim 17, wherein said database resides in disk.

29. An index tree for facilitating referencing to data objects stored in a database, comprising:

a plurality of nodes comprising internal nodes having pointers to child nodes, and leaf nodes having pointers to data objects;

minimum bounding shape, a minimal, multi-dimensional shape enclosing the corresponding data object in the case of a leaf node and all the bounding shapes in the child node in the case of an internal node; and

a quantized, relative representation of the minimum bounding shape, calculated relative to a reference bounding shape, and quantized to finite precision by cutting off insignificant trailing bits.

30. The index tree of claim 29, wherein said plurality of nodes form an R-tree.

31. The index tree of claim 29, wherein said database resides in main memory.

32. The index tree of claim 29, wherein said database resides in disk.